DENON

Hi-Fi Integrated Amplifier

SERVICE MANUAL

MODEL PMA-500V

SOLID STATE
INTEGRATED AMPLIFIER

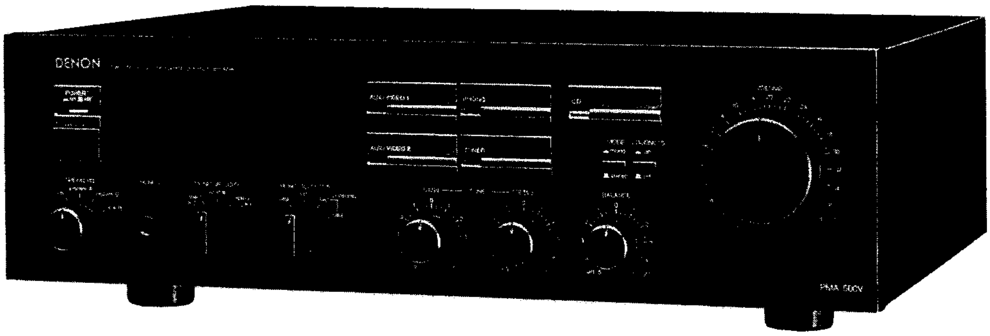


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NIPPON COLUMBIA CO., LTD.

SPECIFICATIONS

POWER AMPLIFIER SECTION

Rated Output Power: Both channel drives (TUNER → SP OUT) 80 Watts minimum rms per channel (8 ohm Load) with less than 0.05% total harmonic distortion from 20 Hz to 20 kHz.
1 kHz (4 ohm Load) 130 W + 130 W (DIN, T.H.D 1%)

Total Harmonic Distortion: 0.007% (20 Hz – 20 kHz at –3 dB rated output 8 ohm Load)
0.003% 1 kHz (at rated output 8 ohm Load)

Input Sensitivity: 150 mV

Input Impedance: 30 k ohm

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output: (REC OUT Terminal) Rated Output: 150 mV

Input Sensitivity Input Impedance:

PHONO	MM	2.5 mV	47 k ohm
	MC	200 μV	100 ohm
CD, VIDEO-1, VIDEO-2, TUNER/AUX, TAPE		150 mV	47 k ohm

RIAA Deviation: PHONO MM within ±0.2 dB (20 Hz – 20 kHz)
MC within ±0.3 dB (20 Hz – 50 kHz)

Maximum Input Voltage: PHONO MM 160 mV/1 kHz
MC 12 mV/1 kHz

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network):
PHONO MM 88 dB (input terminals short-circuited for 5 mV input)
MC 68 dB (input terminals short-circuited for 500 μV input)
TUNER/AUX, CD, TAPE, VIDEO-1, VIDEO-2 105 dB (input terminals short-circuited)

Tone Control Adjustable Range: BASS 100 Hz ±10 dB
TREBLE 10 kHz ±10 dB

Filtering Characteristics: SUBSONIC 16 Hz, 12 dB/oct

Loud Characteristics: Low frequency 100 Hz + 7 dB
High frequency 10 kHz + 6 dB

AC OUTLET: (For U.S.A., Canada and Asia) SWITCHED x 2, 100 W (Total)
UNSWITCHED x 1,250 W

POWER SOURCE: Germany and France AC 220 V, 50 Hz; U.K. and Australia AC 240 V, 50 Hz; U.S.A. and Canada AC 120 V, 60 Hz; Asia 110/120/220/240 V, 50/60 Hz (Multiple)

POWER CONSUMPTION: 3.4A or 170 W (U.S.A.); 3.4A (Canada); 190 W (IEC); 150 W (Multiple)

DIMENSIONS: 434 mm (17-3/32")W x 137 mm (5-25/64")H x 385 mm (15-5/32")D (including rubber feet, control knobs, and terminals.)

WEIGHT: 9.4 kg (20 lbs 12 oz) (For U.S.A. & Canada)
9.7 kg (21 lbs 7 oz) (For Europe, Multiple and Australia Version.)

Design and specifications are subject to change without prior notice.

NOTE: The following codes correspond to the appropriate models.
E3 for U.S.A., EA for Australia, EC for Canada
This Service Manual is prepared based on E2 for Black Version.

For United Kingdom model only.

WARNING:

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral
Brown: Live

For Australia model only.

FOR YOUR SAFETY

To ensure safe operation the three-pin plug supplied must be inserted only into a standard three-pin power point which is effectivly earthed through the normal husehold wiring.

Extension cords used with the equipment must be three-core and be correctly wired to provide connection to earth. Wrongly wired extension cords are a major cause of fatalities.

The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power point, consult a qualified electrician.

For U.S.A. and Canada models.

CAUTION

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

NAMES AND FUNCTIONS OF PARTS

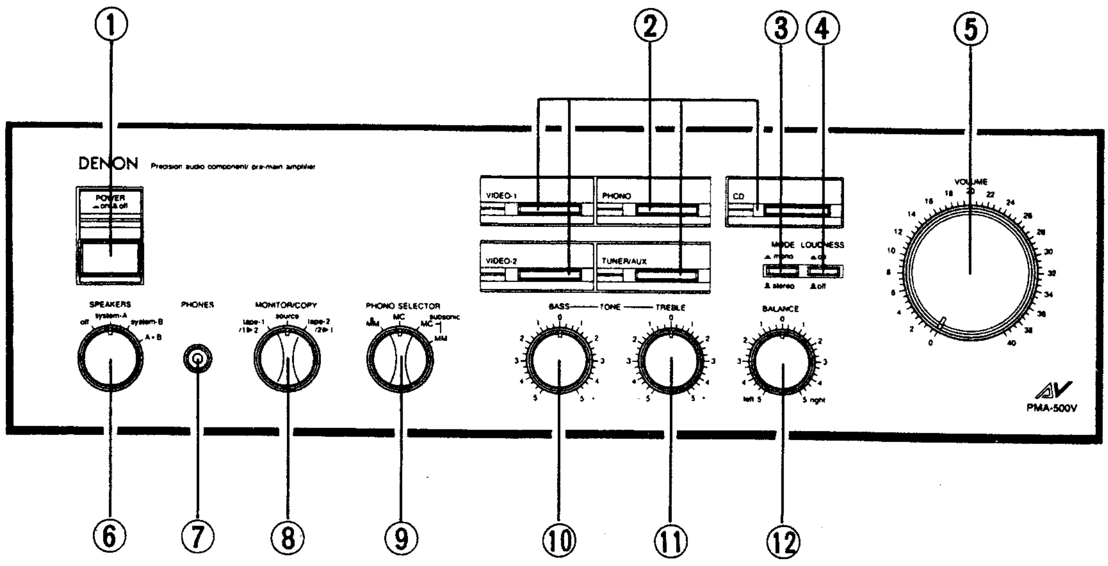


Fig. 1

① POWER and LED indicator
(Power supply button and LED indicator)

② INPUT SELECTOR (Input signal selection button)
CD, PHONO, VIDEO-1, VIDEO-2, TUNER/AUX
(for outside Europe, Australia and U.K. Models.)
CD, PHONO, AUX/VIDEO 1, AUX/VIDEO 2, TUNER
(for Europe, Australia and U.K. Models.)

③ MODE (Mode button)
Stereo ▇ , mono ▁

④ LOUDNESS (Loudness button)
▁ on, ▇ off

⑤ VOLUME (Adjustment of the volume)

⑥ SPEAKERS (Speaker selection switch)
off, System-A, System B, A+B

⑦ PHONES (Headphone Jack)

⑧ MONITOR COPY (Tape monitor/Copy switch)

⑨ PHONO SELECTOR (Cartridge selection/Subsonic filter switch)
Subsonic
MM, MC, MC-MM

⑩ BASS (Regulation of low notes)

⑪ TREBLE (Regulation of high notes)

⑫ BALANCE (Balance adjustment)

Video Input Function

The PMA-500V provides a video input function. The image selection circuitry gives preference to VIDEO-1 for all settings of the INPUT SELECTOR button, unless VIDEO-2 has been specified.
This function might be used, for example, to watch a TV monitor while playing a compact disc. In this case it would connect the image input circuitry of the VIDEO-1 terminal to the image output of a video recorder, tape recorder, or video disc recorder. The resultant monitor out signal would be sent to the TV monitor, for "background video" audio-visual entertainment combining sound and images.

Note:

Please note the following differences in the markings on the front and back panels on the European U.K. and Australia models:

VIDEO-1 → AUX/VIDEO 1
VIDEO-2 → AUX/VIDEO 2
TUNER/AUX → TUNER

In addition, there is no AV mark on the front panel.

REMOVAL OF EACH SECTION

1. Removal of Top Cover

- Remove 8 screws and detach the top cover as per arrow in Fig. 2.

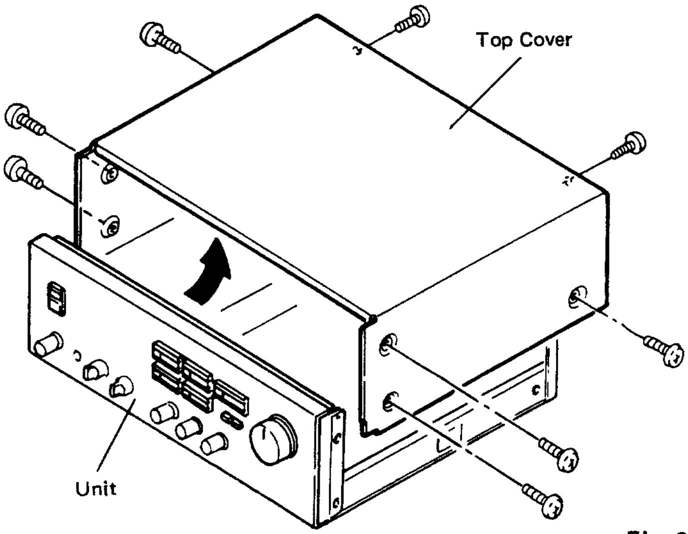


Fig. 2

2. Removal of Back Panel

- Remove 3 screws Ⓐ and 7 screws Ⓑ as per Fig. 3. Also remove screw Ⓒ and detach back panel from the unit.

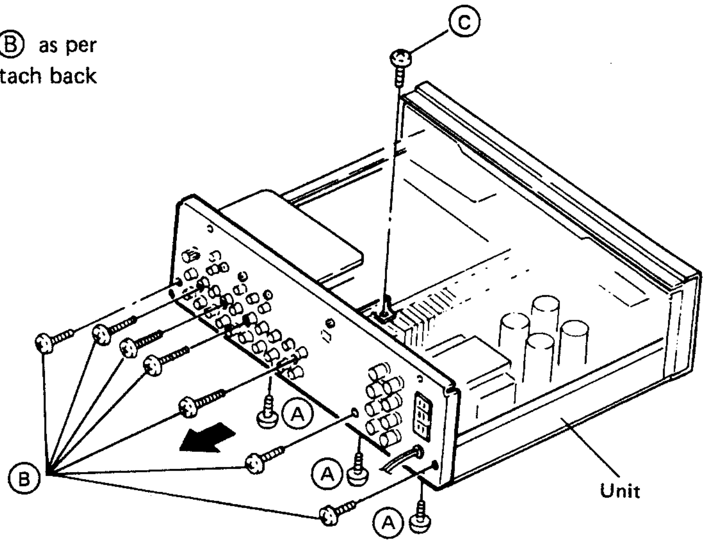


Fig. 3

3. Removal of Front Panel Ass'y

- Remove 4 screws Ⓓ and remove 2 screws Ⓔ. And draw out front panel ass'y.

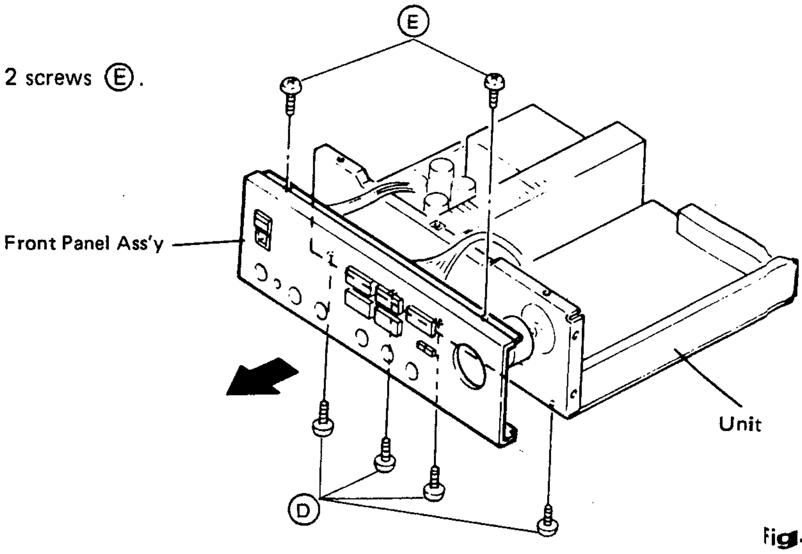
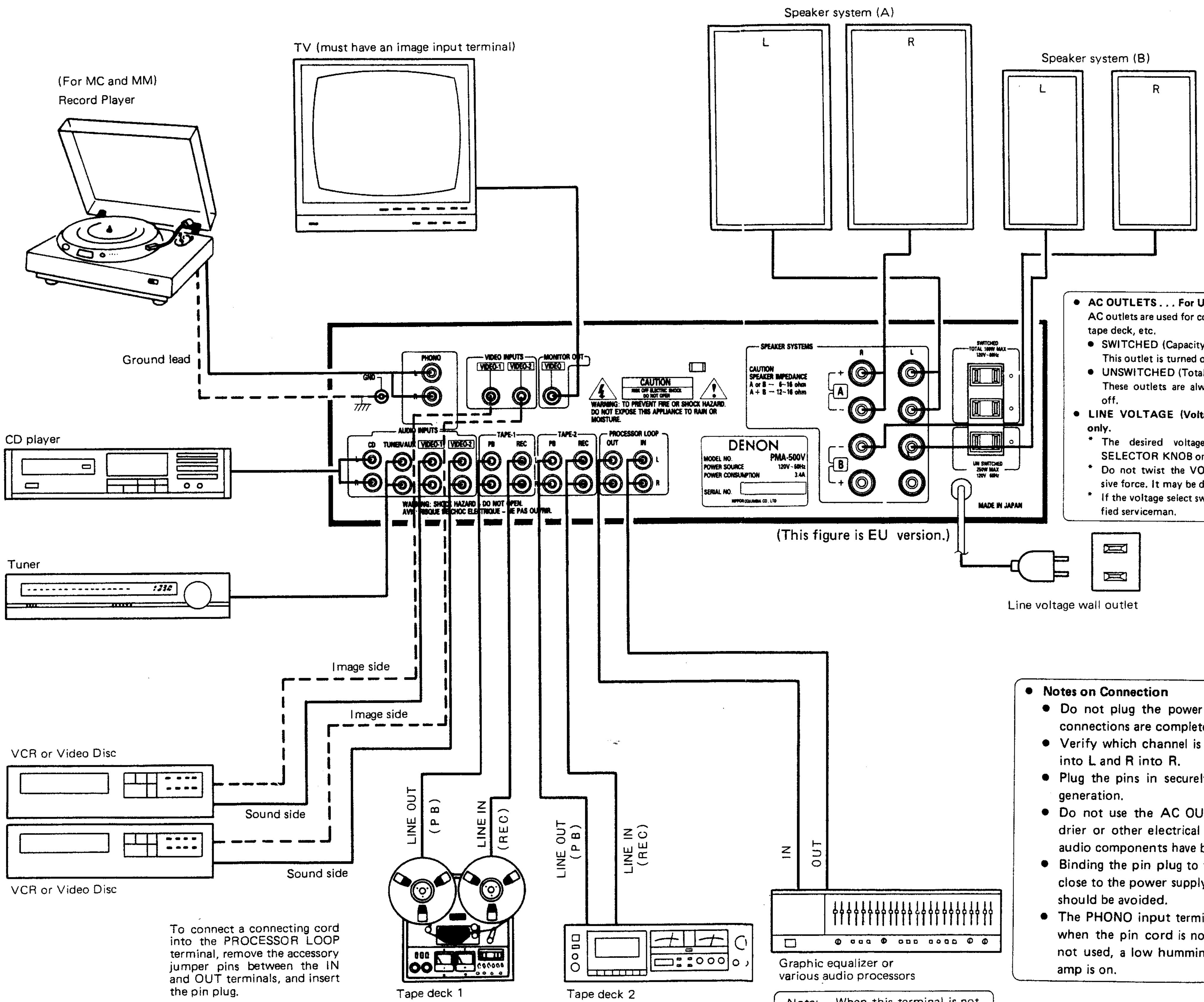


Fig. 4

CONNECTIONS



To connect a connecting cord into the PROCESSOR LOOP terminal, remove the accessory jumper pins between the IN and OUT terminals, and insert the pin plug.

Note: When this terminal is not being used, OUT and IN should be connected with the Jumper Pin.

- **Connection to the speaker system**
  Connect the speaker system for the left channel (the left side as viewed facing the front) to the L speaker terminal on the back panel, and the speaker system for the right channel into the R terminal. There are two sets of SPEAKERS terminals. If only one speaker system is to be used, connect it to the SYSTEM A terminals.

- **AC OUTLETS . . . For U.S.A., Canada and Asia**
  AC outlets are used for connecting amplifier component units, such as tuner, turntable, tape deck, etc.
  - SWITCHED (Capacity: 100 W):
    This outlet is turned on/off when main power swirch is turned on/off.
  - UNSWITCHED (Total capacity: 250 W)
    These outlets are always ON whetehr power switch is on or off.
- **LINE VOLTAGE (Voltage select switch) . . . For Asia model only.**
  - The desired voltage may be set with the VOLTAGE SELECTOR KNOB on the back panel using a screw driver.
  - Do not twist the VOLTAGE SELECTOR KNOB with excessive force. It may be damaged.
  - If the voltage select switch does not turn smoothly, see a qualified serviceman.

PRE-SET LINE VOLTAGE

- **Notes on Connection**
  - Do not plug the power supply cord into the wall socket, until all the connections are complete.
  - Verify which channel is the left and which is the right, and then plug L into L and R into R.
  - Plug the pins in securely. An incomplete connection will cause noise generation.
  - Do not use the AC OUTLETS terminals to provide power for a hair drier or other electrical appliance after the power supply cords of the audio components have been plugged in.
  - Binding the pin plug to the power supply cord, or setting the pin cord close to the power supply transformer will cause humming or noise, and should be avoided.
  - The PHONO input terminal is extremely sensitive. Avoid using the amp when the pin cord is not plugged into the terminal. If the pin cord is not used, a low humming may be emitted from the speaker when the amp is on.

Fig. 5

- **Connecting a video device**
  Connect the output terminals of the video device (OUTPUT) to the VIDEO terminals of the amp, using a pin plug cord.

- **CONNECTING A VIDEO DEVICE**

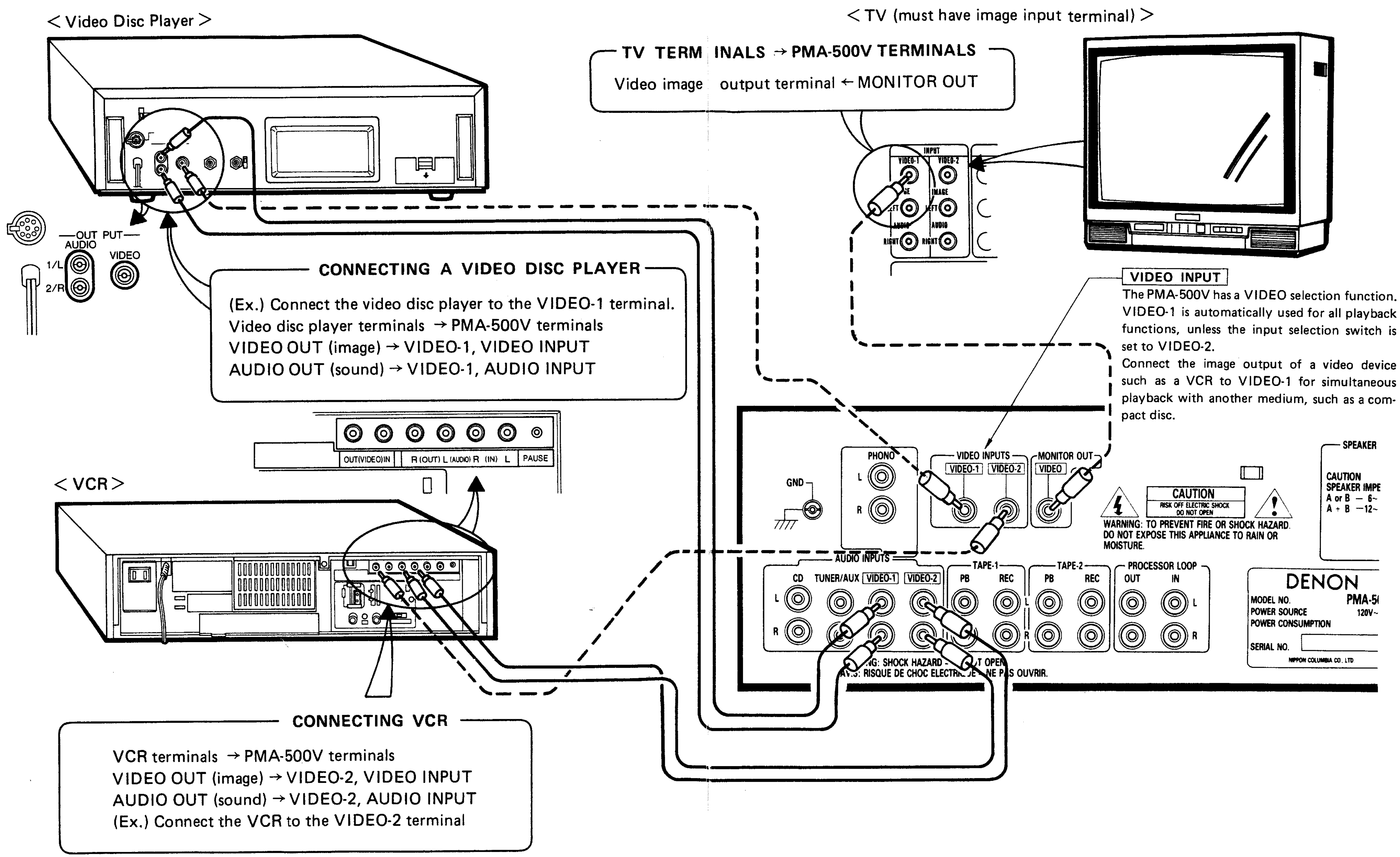


Fig. 6

BLOCK DIAGRAM

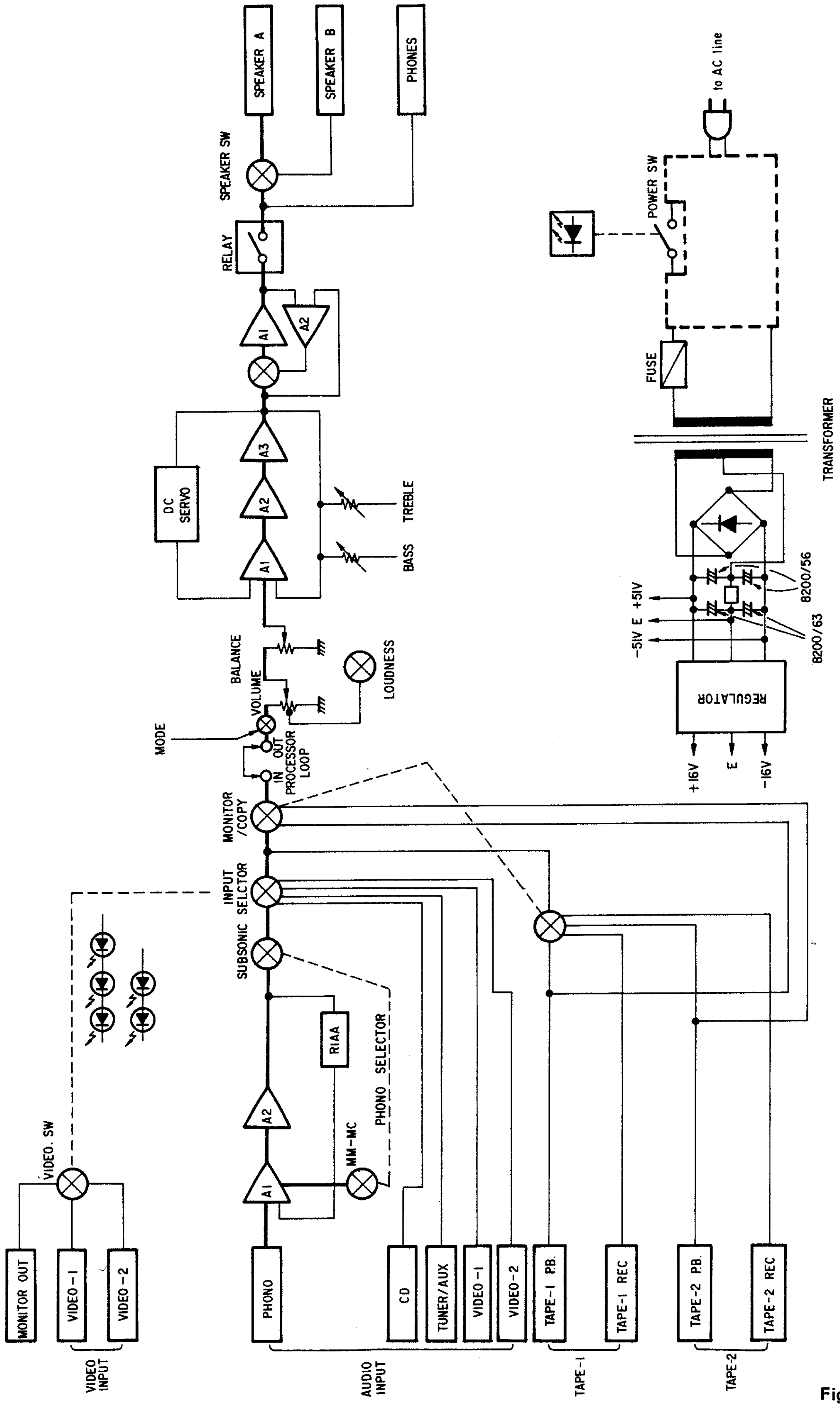


Fig. 7

METHOD OF ADJUSTMENTS

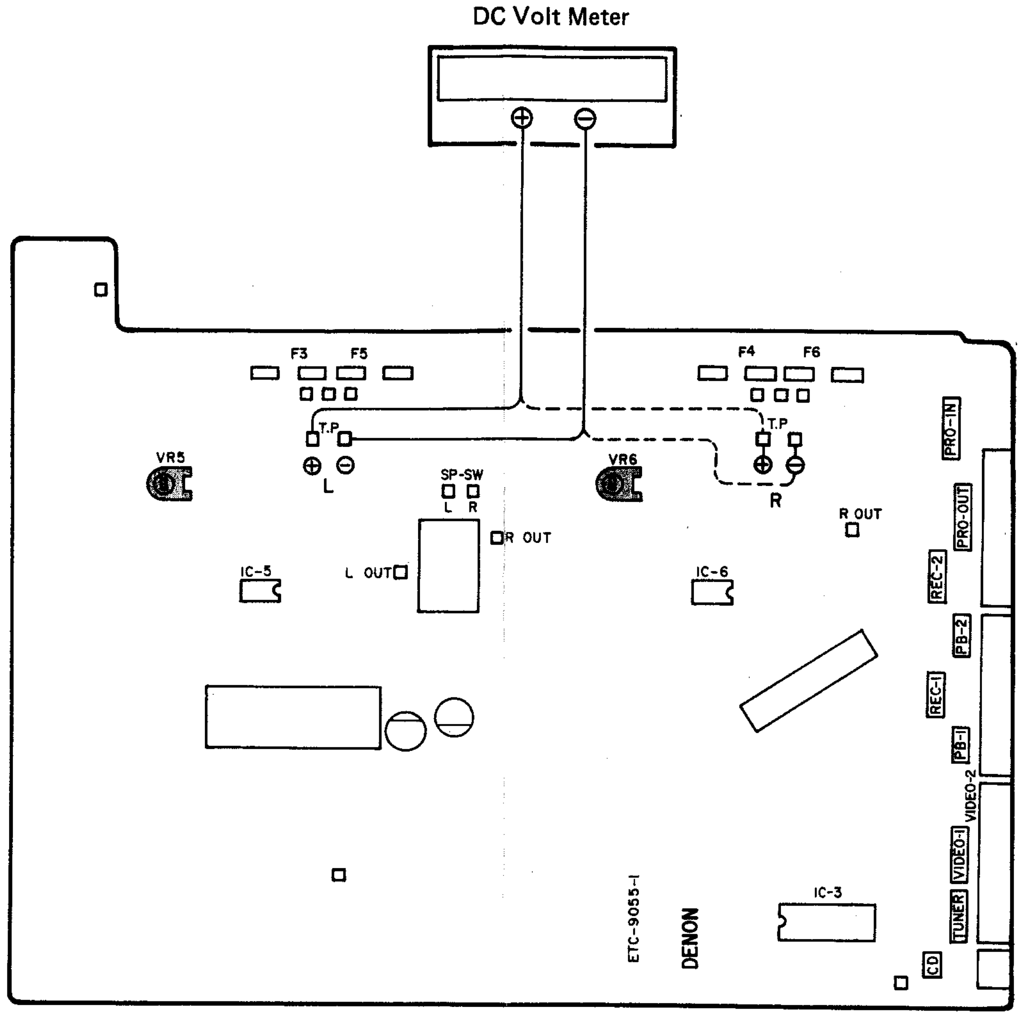


Fig. 8

IDLING CURRENT (Fig. 8)

- **Setup**
  1. Lay the unit at an ordinary position away from a direct current from a cooler or fan. Do the adjustment at a tempera-ture between 15°C and 30°C.
  2. Set controls as follows.

     POWER SWITCH → off (▐)
     VOLUME CONTROL → fully counterclockwise. (↶ min)
     SPEAKER Terminals → open: do not connect the speakers, dummy load etc.

- **Adjustment**
  1. Remove Top cover. And then connect DC Voltmeter to Test points of ETC-9055-1 (INPUT & POWER Unit).
  2. Connect Power cord to AC outlet, and turn Power Switch "on" (▁). Within 10 seconds turn VR5 (Lch) and VR6 (Rch) clockwise so that the DC voltmeter reads

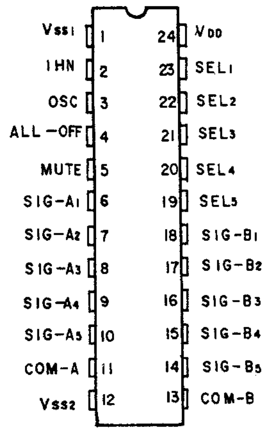
     1.5 ± 0.1 mVDC
  3. Then after 3 minutes warmup adjust VR5 and VR6 so that the DC Voltmeter reads

     4 ± 0.5 mV

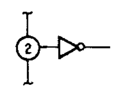
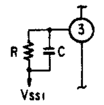
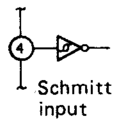
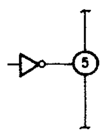
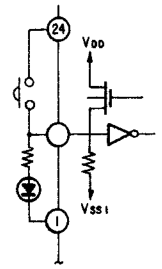
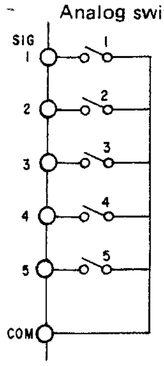
SEMICONDUCTORS

- **IC's**

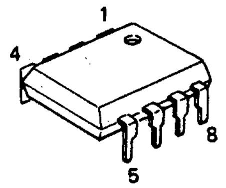
TC9152P (Toshiba)

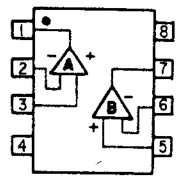


FUNCTION OF EACH TERMINAL

TERMINAL NO.	SYMBOL	FUNCTION	REMARKS
2	INH	Inhibit input terminal. Normal operation at "H" level, inhibit operation at "L" level.	
3	OSC	C.R connecting terminal for oscillator. With this oscillation frequency, muting time and switching time of analog will be set.	
4	ALL-OFF	Specified OFF input terminal of all analog switches. Applying "H" level to turn off all analog switches.	 Schmitt trigger input
5	MUTE	Output terminal of muting signal. By receiving of "H" level at select input terminals (SEL-1 ~ SEL-5), this terminal becomes "H" level for settled time and within this time analog switch will shift.	
23 22 21 20 19	SEL-1 SEL-2 SEL-3 SEL-4 SEL-5	Select input terminals for respective analog switches. Turn SEL-1 ~ SEL-5 terminals to "H" level to turn on respective analog switches. SEL-1 ~ SEL-5 are all reciprocal reset. These terminals are in conjunction with driver output I/O terminals.	
6/18	SIG-A_1 SIG-B_1	Signal input terminal 1. Select SEL-1 to turn on analog switch 1 and this terminal will conduct to COM terminal.	Analog switch 
7/17	SIG-A_2 SIG-B_2	Signal input terminal 2. Select SEL-2 to turn on analog switch 2 and this terminal will conduct to COM terminal.	
8/16	SIG-A_3 SIG-B_3	Signal input terminal 3. Select SEL-3 to turn on analog switch 3 and this terminal will conduct to COM terminal.	
9/15	SIG-A_4 SIG-B_4	Signal input terminal 4. Select SEL-4 to turn on analog switch 4 and this terminal will conduct to COM terminal.	
10/14	SIG-A_5 SIG-B_5	Signal input terminal 5. Select SEL-5 to turn on analog switch 5 and this terminal will conduct to COM terminal.	
11/13	COM-A COM-B	Common terminal for analog switches.	
24 1 12	V_{DD} V_{SS1} V_{SS2}	Power supply voltage applying terminal. For control system V_{DD}-V_{SS1}. For analog switch system V_{DD}-V_{SS2}.	

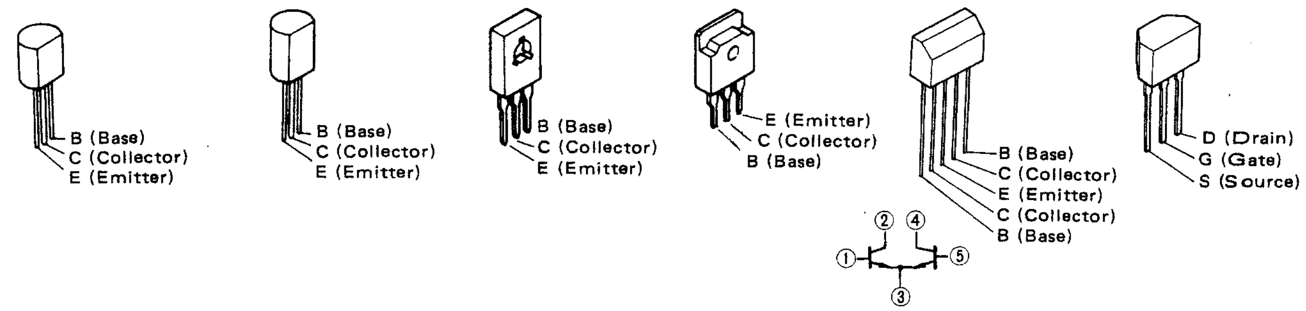
M5218P (Mitsubishi)
M5220P (Mitsubishi)
LA6458DF (Sanyo)
NJM2043DD (JRC)





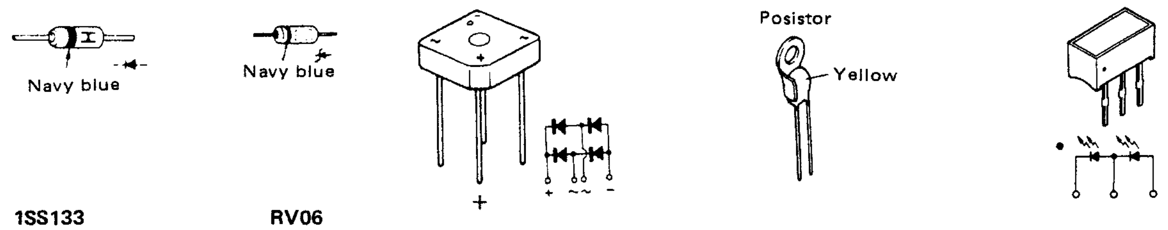
- **TRANSISTORS (Including FET)**

2SA1015(Y) 2SC1815(BL) 2SC2878(A/B) 2SA988(E/F) 2SC1841(E/F)	2SD667A(C) 2SB647A(C)	2SA1358(Y/O) (Green) 2SC3421(Y/O) (Black)	2SA1106(O/Y) 2SC2581(O/Y)	2SC2259(G)	FET 2SK381(C)/(D)



- **DIODES (Including LED)**

1S2076A	HZ7B-3 HZ15-2 HZ18-2 HZ24-2	RB602LF-F	PTH487A01BD222TS	LED LD-001VR (Red) LD-001DU (Orange)

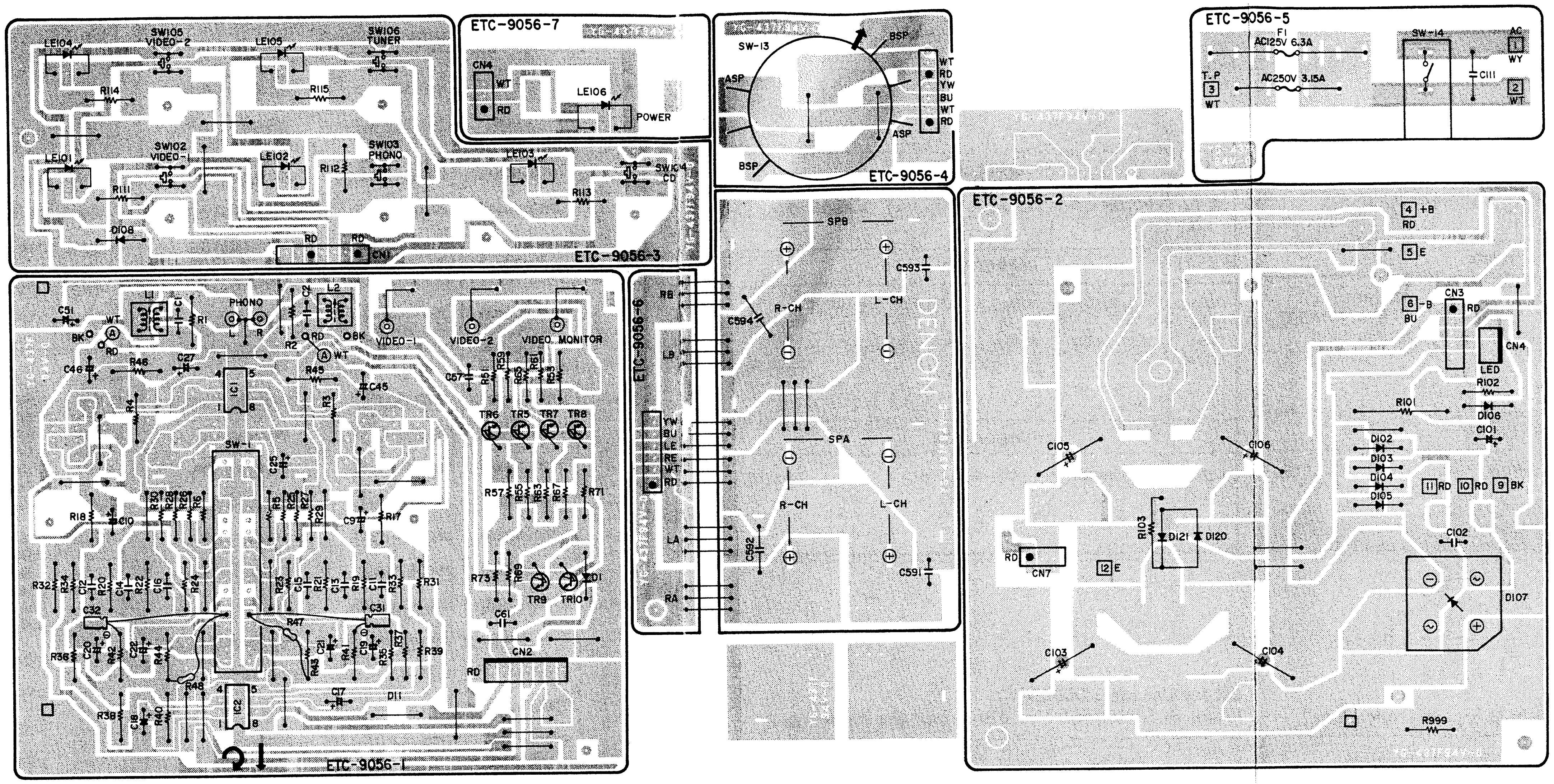


1SS133	RV06



PRINTED WIRING BOARD PATTERNS AND PARTS LIST

ETC9056B EQ. & PS UNIT



ETC9056B EQ. & PS UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
		SEMICONDUCTORS	
IC001	2650037007	NJM-2043DD IC (JRC)	
IC002	2630229013	LA-6458DF IC (SANYO)	
TR005	2710102005	2SA1015(Y) TRANSISTOR	
TR006	2730198015	2SC1815(BL) TRANSISTOR	
TR007	2710102005	2SA1015(Y) TRANSISTOR	
TR008 ~010	2730198015	2SC1815(BL) TRANSISTOR	
D001	2760220021	HZ24-2 ZENER	
D102 ~105	2760049011	1S2076A DIODE	
D106	2760249002	HZ18-2 ZENER	
D107	2760409004	RB602F-LFD DIODE	
D108	2760249002	HZ18-2 ZENER	
D120, 121	2760237001	RV06 DIODE	
LE101 ~105	3939310004	LD-001VR LED (INPUT)	
LE106	3939310017	LD-001DU LED (POWER)	
		RESISTORS (not included Carbon Film ±5%, 1/4W Type)	
⚠R101	2440042024	1.2k ohm ±5% 1W METAL OXIDE FILM (NBF)	
⚠R103	2440058021	0.47 ohm ±5% 2W METAL OXIDE FILM (NBF)	
		CAPACITORS	
C001	2533631009	150pF ±5% 50V CERAMIC	
C001	2533627000	100pF ±5% 50V CERAMIC	
C002	2533631009	150pF ±5% 50V CERAMIC	
C002	2533627000	100pF ±5% 50V CERAMIC	
C009, 010	2544161021	100μF ±20% 6.3V ELECTROLYTIC	
C011, 012	2551140048	0.068μF ±5% 50V PLASTIC FILM	
C013, 014	2551121054	0.018μF ±5% 50V PLASTIC FILM	
C015, 016	2533643000	470pF ±5% 50V CERAMIC	
C017, 018	2544161021	100μF ±20% 6.3V ELECTROLYTIC	
C019, 020	2544147003	2.2μF 50V ELECTROLYTIC	
C021, 022	2544146004	1μF 50V ELECTROLYTIC	
C025	2544146004	1μF 50V ELECTROLYTIC	
C027	2544146004	1μF 50V ELECTROLYTIC	
C031, 032	2544143007	33μF 35V ELECTROLYTIC	
C045, 046	2544132005	10μF 16V ELECTROLYTIC	
C051	2544146004	1μF 50V ELECTROLYTIC	
C057	2531024003	0.01μF +80,−20% 50V CERAMIC	
C061	2531024003	0.01μF +80,−20% 50V CERAMIC	
C101	2544150003	10μF 50V ELECTROLYTIC	
C102	2531052004	4700pF +100,−0% 500V CERAMIC	
C103 ~106	2544216015	6800μF ±20% 63V ELECTROLYTIC	
⚠C111	2538010007	0.01μF +100,−0% 400V(AC) CERAMIC	
C591 ~594	2531023004	4700pF +80,−20% 50V CERAMIC	
		SWITCHES	
SW001	2129521002	SLIDE SW REMOTE (PHONO)	
SW013	2129522001	ROTARY SWITCH (SP)	
SW014	2124409006	POWER SWITCH	
SW102 ~106	2124407008	TACT SWITCH (INPUT)	
		OTHER PARTS	**Q'ty**
	2229056105	P.W. BOARD	1
	2090008120	JUMPER WIRE P=10mm	56
	EP-5667H1	TERMINAL PIN L=21mm	12
L001, 002	2359003002	FTZ CHOKE COIL	2
	2020022008	FUSE HOLDER (AC LINE FOOL)	2
⚠F001	2061015074	FUSE 3.15A (AC LINE)	1
	2050274004	2P CONNECTOR BASE	1
	2050240009	3P CONNECTOR BASE	1
	2050144008	8P TERMINAL	1
CN001	2042052098	7P NH CONNECTOR CORD (TACT SW & LED)	1
CN001	2050243077	7P WIRE HOLDER (TACT SW & LED)	1
CN002	2050190078	7P NH CONNECTOR BASE (EQ & VIDEO SW)	1
CN003	2038123067	5P NH CONNECTOR CORD (+ − B & MUTING)	1
CN004	2050190036	3P NH CONNECTOR BASE	1
CN004	2034185012	3P CONNECTOR CORD (POWER LED)	1
CN004	2050185038	3P WIRE HILDER (POWER LED)	1
	4450057010	CORD CLIP	2
	2050185054	5P WIRE HOLDER (+ − B & MUTING)	1
	2050185067	6P WIRE HOLDER (SP CORD)	2

E1, EP1 for Asia ETC9056D
(Same as ETC9056B (for E2) except the followings.)

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
IC001	2630317006	M-5220P (MITSUBISHI) IC CHANGE
		RESISTORS
R001, 002	2412044005	10 ohm ±5% 1/4W CARBON CHANGE
		CAPACITORS
C001, 002	2533627000	100pF ±5% 50V CERAMIC CHANGE
C591 ~594	2531023004	4700pF +80,−20% 50V CERAMIC DELETE
		OTHER PARTS
L001, 002	2359003002	FTZ CHOKE COIL DELETE
	EP-5870	FUSE HOLDER (2) CHANGE
⚠F001	2061017001	FUSE 6.3A (1) CHANGE

EK for U.K. and EA for Australia ETC9056F
(Same as ETC9056B (for E2) except the followings.)

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
IC001	2630317006	M-5220P (MITSUBISHI) IC CHANGE
		RESISTORS
R001, 002	2412044005	10 ohm ±5% 1/4W CARBON CHANGE
		CAPACITORS
C001, 002	2533627000	100pF ±5% 50V CERAMIC CHANGE
C591 ~594	2531023004	4700pF +80,−20% 50V CERAMIC DELETE
		OTHER PARTS
L001, 002	2359003002	FTZ CHOKE COIL DELETE

EU for U.S.A. ETC9056E
(Same as ETC9056B (for E2) except the followings.)

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
IC001	2630317006	M-5220P (MITSUBISHI) IC CHANGE
		RESISTORS
R001, 002	2412044005	10 ohm ±5% 1/4W CARBON CHANGE
		CAPACITORS
C001, 002	2533627000	100pF ±5% 50V CERAMIC DELETE
C017, 018	2544088010	100μF 16V ELECTROLYTIC CHANGE
C025	2544203002	1μF 160V ELECTROLYTIC CHANGE
C101	2544180028	10μF 63V ELECTROLYTIC CHANGE
C591 ~594	2531023004	4700pF +80,−20% 50V CERAMIC DELETE
		OTHER PARTS
L001, 002	2359003002	FTZ CHOKE COIL DELETE
⚠F001	2061046001	FUSE 6.3AUL ℓ: 20mm CHANGE

EC for Canada ETC9056C
(Same as ETC9056B (for E2) except the followings.)

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
IC001	2630317006	M-5220P (MITSUBISHI) IC CHANGE
		RESISTORS
R001, 002	2412044005	10 ohm ±5% 1/4W CARBON CHANGE
		CAPACITORS
C001, 002	2533627000	100pF ±5% 50V CERAMIC DELETE
C017, 018	2544088010	100μF 16V ELECTROLYTIC CHANGE
C025	2544203002	1μF 160V ELECTROLYTIC CHANGE
C101	2544180028	10μF 63V ELECTROLYTIC CHANGE
C591 ~594	2531023004	4700pF +80,−20% 50V CERAMIC DELETE
		OTHER PARTS
L001, 002	2359003002	FTZ CHOKE COIL DELETE
⚠F001	2061046001	FUSE 6.3AUL ℓ: 20mm CHANGE
⚠SW-14	2129525008	POWER SWITCH CHANGE

ETC9055B INPUT & POWER UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
IC003	2620581004	TC9152P IC (TOSHIBA)
IC005, 006	2630257001	M-5218P IC (MITSUBISHI)
TR151	2730198015	2SC1815(BL) TRANSISTOR
TR152	2710102005	2SA1015(Y) TRANSISTOR
TR153	2730198015	2SC1815(BL) TRANSISTOR
TR155, 156	2730253015	2SC2878(A/B) TRANSISTOR
TR201 ~203	2730198015	2SC1815(BL) TRANSISTOR
TR204	2710102005	2SA1015(Y) TRANSISTOR
TR205	2730253015	2SC2878(A/B) TRANSISTOR
TR206, 207	2730198015	2SC1815(BL) TRANSISTOR
TR208	2710102005	2SA1015(Y) TRANSISTOR
TR209	2740060007	2SD667A(C) TRANSISTOR
TR210	2720053005	2SB647A(C) TRANSISTOR
TR211, 212	2750043014	2SK381(C)/(D) FET
TR401, 402	2730191009	2SC2259(G) TRANSISTOR
TR409 ~414	2710131021	2SA988(E/F) TRANSISTOR
TR415, 416	2730235020	2SC1841(E/F) TRANSISTOR
TR417, 418	2710131021	2SA988(E/F) TRANSISTOR
TR419, 420	2730235020	2SC1841(E/F) TRANSISTOR
TR501, 502	2730198015	2SC1815(BL) TRANSISTOR
TR503, 504	2730323000	2SC3421(O/Y) TRANSISTOR
TR505, 506	2710195009	2SA1358(O/Y) TRANSISTOR
D152, 153	2760401002	1SS133 DIODE
D171 ~173	2760401002	1SS133 DIODE
D201	2760049011	1S2076A DIODE
D202	2760249002	HZ18-2 ZENER
D208	2760049011	1S2076A DIODE
D401 ~406	2760401002	1SS133 DIODE
D501 ~504	2760253001	HZ15-2 ZENER
D507 ~510	2760254000	HZ7B-3 ZENER
D527 ~530	2760401002	1SS133 DIODE
D531, 532	2760049011	1S2076A DIODE
		RESISTORS (not included Carbon Film ±5%, 1/4W Type)
⚠ R201, 202	2440038025	560 ohm ±5% 1W METAL OXIDE FILM (NBF)
⚠ R207	2412321045	220 ohm ±5% 1/4W CARBON (NBF)
⚠ R413 ~416	2412321029	1.5k ohm ±5% 1/4W CARBON (NBF)
⚠ R423, 424	2412377934	91 ohm ±5% 1/4W CARBON (NBS)
⚠ R429 ~432	2412378904	180 ohm ±5% 1/4W CARBON (NBS)
⚠ R433	2412376964	47 ohm ±5% 1/4W CARBON (NBS)
⚠ R434	2412321061	47 ohm ±5% 1/4W CARBON (NBF)
⚠ R435 ~438	2412375981	22 ohm ±5% 1/4W CARBON (NBS)
⚠ R501, 502	2440049027	4.7k ohm ±5% 1W METAL OXIDE FILM (NBF)
⚠ R505, 506	2440049027	4.7k ohm ±5% 1W METAL OXIDE FILM (NBF)
⚠ R549, 550	2412321045	220 ohm ±5% 1/4W CARBON (NBF)

Same as ETC9055F for U.K. and Australia

Ref. No.	Part No.	Part Name & Descriptions
⚠ R567 ~574	2442013080	0.22 ohm ±5% 1W METAL OXIDE FILM (NBF)
⚠ R585, 586	2440021029	22 ohm ±5% 1W METAL OXIDE FILM (NBF)
⚠ R587, 588	2440017020	10 ohm ±5% 1W METAL OXIDE FILM (NBF)
⚠ R591, 592	2440030023	120 ohm ±5% 1W METAL OXIDE FILM (NBF)
VR001	2119018004	100k ohm VARIABLE RESISTOR (MAIN VR)
VR002	2119021004	250k ohm VARIABLE RESISTOR (BALANCE VR)
VR003	2119022016	250k ohm VARIABLE RESISTOR (BASS VR)
VR004	2119022003	50k ohm VARIABLE RESISTOR (TREBLE VR)
VR005, 006	2116000099	2k ohm SEMIFIXED RESISTOR (BIAS VR)
		CAPACITORS
C055	2544146004	1μF 50V ELECTROLYTIC
C059	2544146004	1μF 50V ELECTROLYTIC
C151	2554199986	0.001μF ±5% 50V PLASTIC FILM
C155	2544164031	220μF ±20% 25V ELECTROLYTIC
C157	2531024003	0.01μF +80, −20% 50V CERAMIC
C171	2544146004	1μF 50V ELECTROLYTIC
C201, 202	2531024003	0.01μF +80,−20% 50V CERAMIC
C203	2533627000	100pF ±5% 50V CERAMIC
C204	2544141009	10μF 35V ELECTROLYTIC
C205	2544127007	220μF 6.3V ELECTROLYTIC
C206	2544005006	330μF 6.3V ELECTROLYTIC
C207	2544132005	10μF 16V ELECTROLYTIC
C301, 302	2531004007	0.001μF ±10% 50V CERAMIC
C303, 304	2551140051	0.082μF ±5% 50V PLASTIC FILM
C305, 306	2544089006	1μF 50V ELECTROLYTIC
C401, 402	2533627000	100pF ±5% 50V CERAMIC
C403, 404	2533643000	470pF ±5% 50V CERAMIC
C405, 406	2531006005	2200pF ±10% 50V CERAMIC
C409, 410	2531024003	0.01μF +80,−20% 50V CERAMIC
C411, 412	2534355009	5pF ±0.25pF 500V CERAMIC
C413 ~416	2533627000	100pF ±5% 50V CERAMIC
C417, 418	2544132005	10μF 16V ELECTROLYTIC
C419, 420	2533617007	39pF ±5% 50V CERAMIC
C421, 422	2533599002	6pF ±0.5pF 50V CERAMIC
C427, 428	2544059078	2.2μF 63V ELECTROLYTIC
C429, 430	2544127007	220μF 6.3V ELECTROLYTIC
C451, 452	2551074004	0.015μF ±10% 50V PLASTIC FILM
C453, 454	2551140064	0.12μF ±5% 50V PLASTIC FILM
C457, 458	2551070008	0.0068μF ±10% 50V PLASTIC FILM
C459, 460	2551061004	0.0012μF ±10% 50V PLASTIC FILM
C461, 462	2551135095	0.056μF ±5% 50V PLASTIC FILM
C465, 466	2533633007	180pF ±5% 50V CERAMIC
C501 ~504	2544138009	47μF 25V ELECTROLYTIC

Ref. No.	Part No.	Part Name & Descriptions	
C505, 506	2533603008	10pF ±0.5pF 50V CERAMIC	
C507 ~510	2533639001	330pF ±5% 50V CERAMIC	
C511 ~514	2544146004	1μF 50V ELECTROLYTIC	
C531 ~534	2534285001	47pF ±5% 500V CERAMIC	
C539, 540	2551072006	0.01μF ±10% 50V PLASTIC FILM	
C541, 542	2551076002	0.022μF ±10% 50V PLASTIC FILM	
C543 ~546	2544059036	4.7μF 63V ELECTROLYTIC	
		SWITCHES & RELAY	
SW007	2124254002	SLIDE SW (REMOTE, T. MONI)	
SW010, 011	2129523000	2P PUSH SWITCH (MODE & LOUD)	
RL001	2140037009	RELAY (SPEAKER)	
		OTHER PARTS	**Q'ty**
	2229055300	P.W. BOARD	1
	2090008146	JUMPER WIRE P=5mm	22
	2090008120	JUMPER WIRE P=10mm	199
J701 ~703	2090008104	JUMPER P=15mm	3
J705	2090008104	JUMPER P=15mm	1
J010	2090008159	JUMPER	1
	EP-5667H1	TERMINAL PIN L=21mm	12
J501, 502	2359001004	INDUCTOR (1μH)	2
	4140240001	EARTH PLATE (GND)	1
	2048191005	HEADPHONE JACK	1
	2020022008	FUSE HOLDER (+ – B F003~006)	8
	2050274004	2P CONNECTOR BASE (CD)	1
	2050152003	6P CONNECTOR BASE (CD)	3
	2050190036	3P NH CONNECTOR BASE (POWER INPUT)	1
CN001	2050190078	7P NH CONNECTOR BASE (TACT SW & LED)	1
CN002	2050185070	7P WIRE HOLDER	1
CN002	2042052014	7P CONNECTOR CORD (EQ & VIDEO SW)	1
CN003	2050190052	5P NH CONNECTOR BASE	1
W003	2034200010	3P CONNECTOR CORD	1
	2050185038	3P WIRE HILDER	11
	4450033005	WIRE CLAMP BAND	1
F003 ~006	2061040036	FUSE 5A F	4
	5139119032	FUSE LABEL (F5A)	2

E1, EP1 for Asia ETC9055D
(Same as ETC9055B (for E2) except the followings.)

Ref. No.	Part No.	Part Name & Descriptions
		OTHER PARTS
F003 ~006	2061041035	FUSE (F) 6.3A (4) CHANGE
	5139119032	FUSE LABEL (F5A) (2) DELETE

EU for U.S.A. ETC9055E
(Same as ETC9055B (for E2) except the followings.)

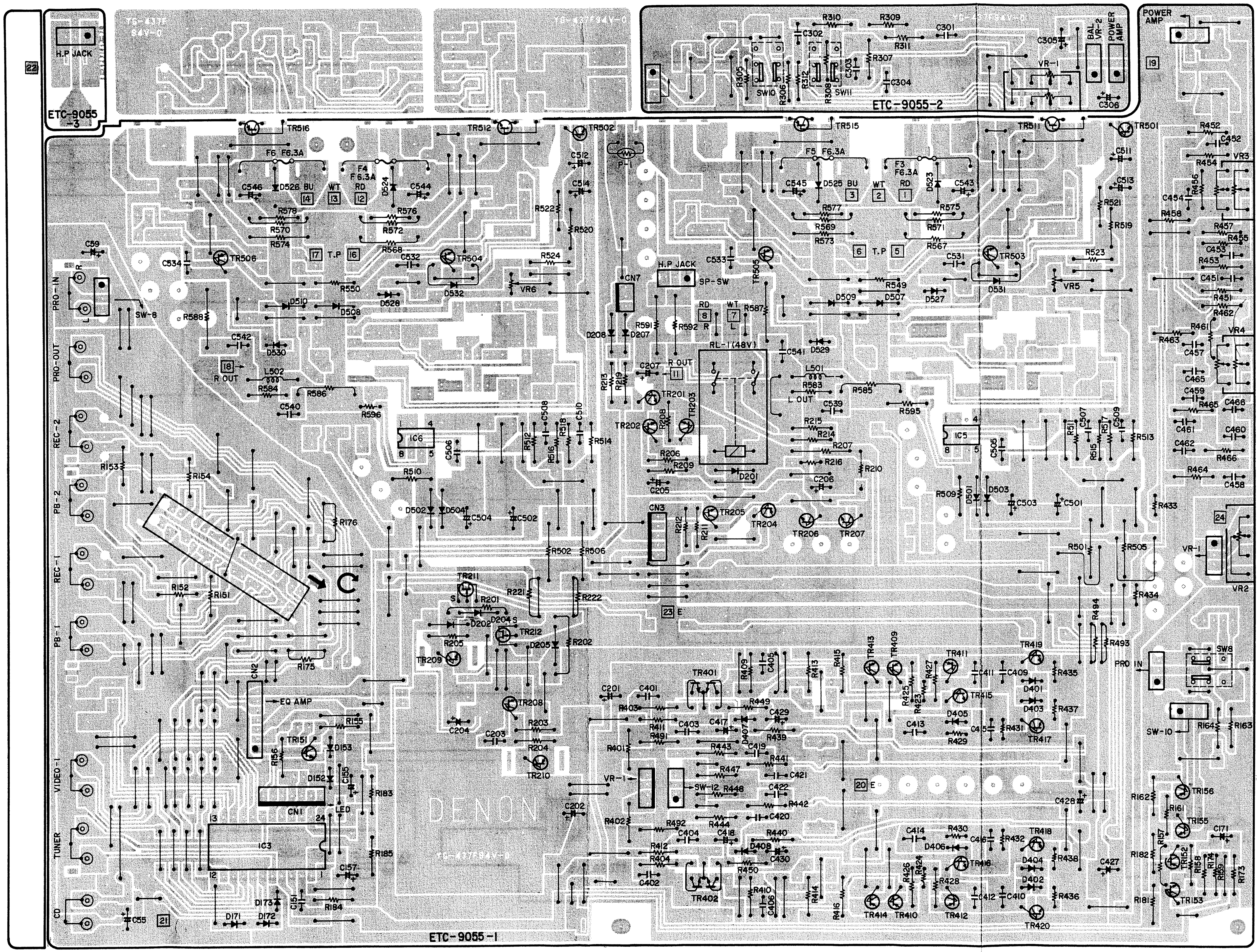
Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
D523 ~526	2760049011	1S2076A DIODE DELETE
		RESISTORS
⚠R221, 222	2412369010	1 ohm ±5% 1/4W CARBON (NBF) CHANGE
⚠R493, 494	2412369010	1 ohm ±5% 1/4W CARBON (NBF) CHANGE
		CAPACITORS
C204	2544180028	10μF 63V ELECTROLYTIC CHANGE
C429, 430	2544088010	100μF 16V ELECTROLYTIC CHANGE
C543 ~546	2544203002	1μF 160V ELECTROLYTIC CHANGE
		OTHER PARTS
F003 ~006	2061046001	FUSE 6.3AUL (ℓ: 20mm) (4) CHANGE
	5139119032	FUSE LABEL (F5A) (2) DELETE
	5139134004	FUSE LABEL (1) ADD

EC for Canada ETC9055C
(Same as ETC9055B (for E2 except the followings.)

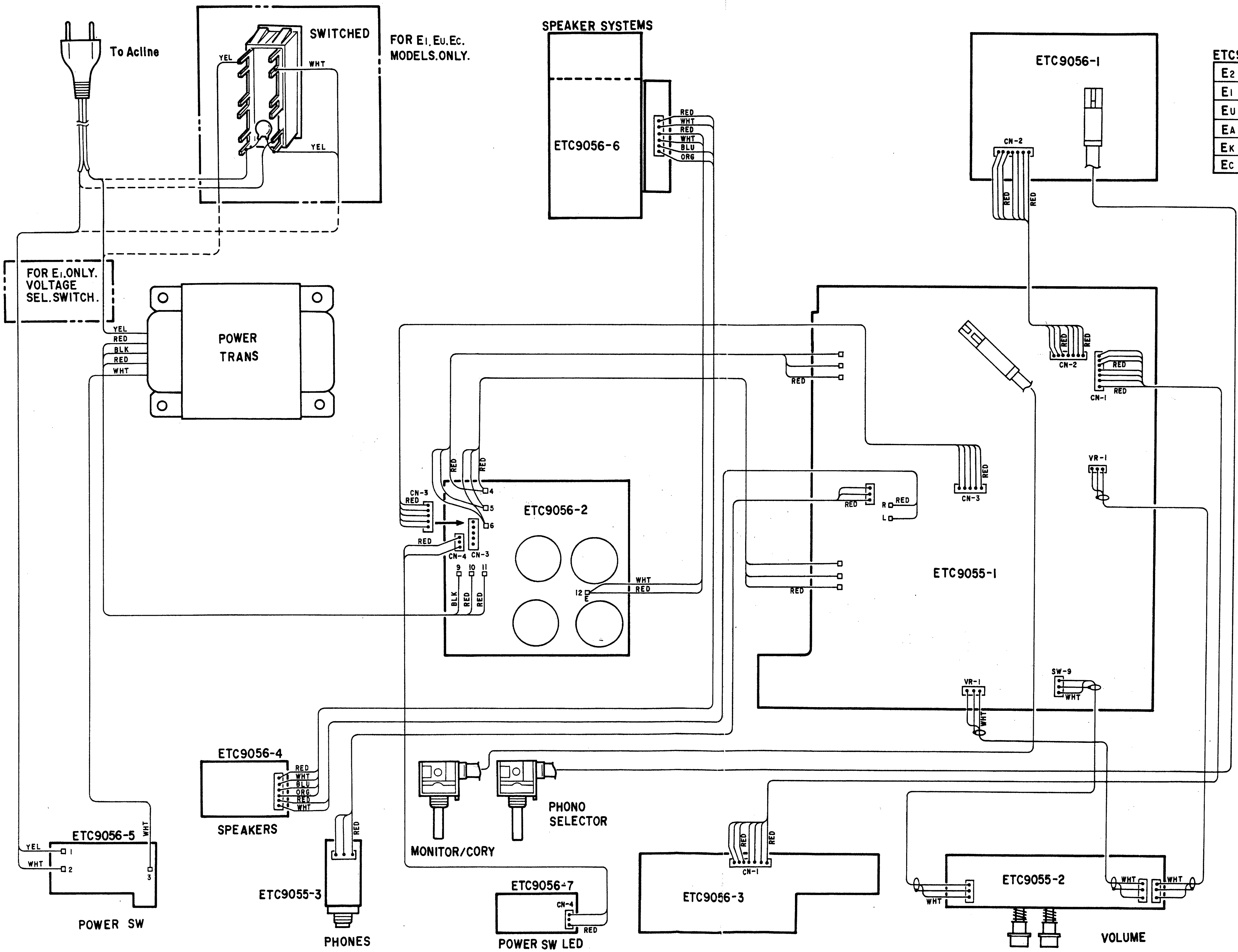
Ref. No.	Part No.	Part Name & Descriptions
		SEMICONDUCTORS
D523 ~526	2760049011	1S2076A DIODE DELETE
		RESISTORS
⚠R221, 222	2412369010	1 ohm ±5% 1/4W CARBON (NBF) CHANGE
⚠R493, 494	2412369010	1 ohm ±5% 1/4W CARBON (NBF) CHANGE
		CAPACITORS
C204	2544180028	10μF 63V ELECTROLYTIC CHANGE
C429, 430	2544088010	100μF 16V ELECTROLYTIC CHANGE
C543 ~546	2544203002	1μF 160V ELECTROLYTIC CHANGE
		OTHER PARTS
F003 ~006	2061046001	FUSE 6.3AUL (ℓ: 20mm) (4) CHANGE
	5139119032	FUSE LABEL (F5A) (2) DELETE
	5139134004	FUSE LABEL (1) ADD

EK for U.K. and EA for Australia: ETC9055F
(Same as ETC9055B (for E2)).

ETC9055B INPUT & POWER UNIT



WIRING DIAGRAM
(This figure is specifications of E2.)



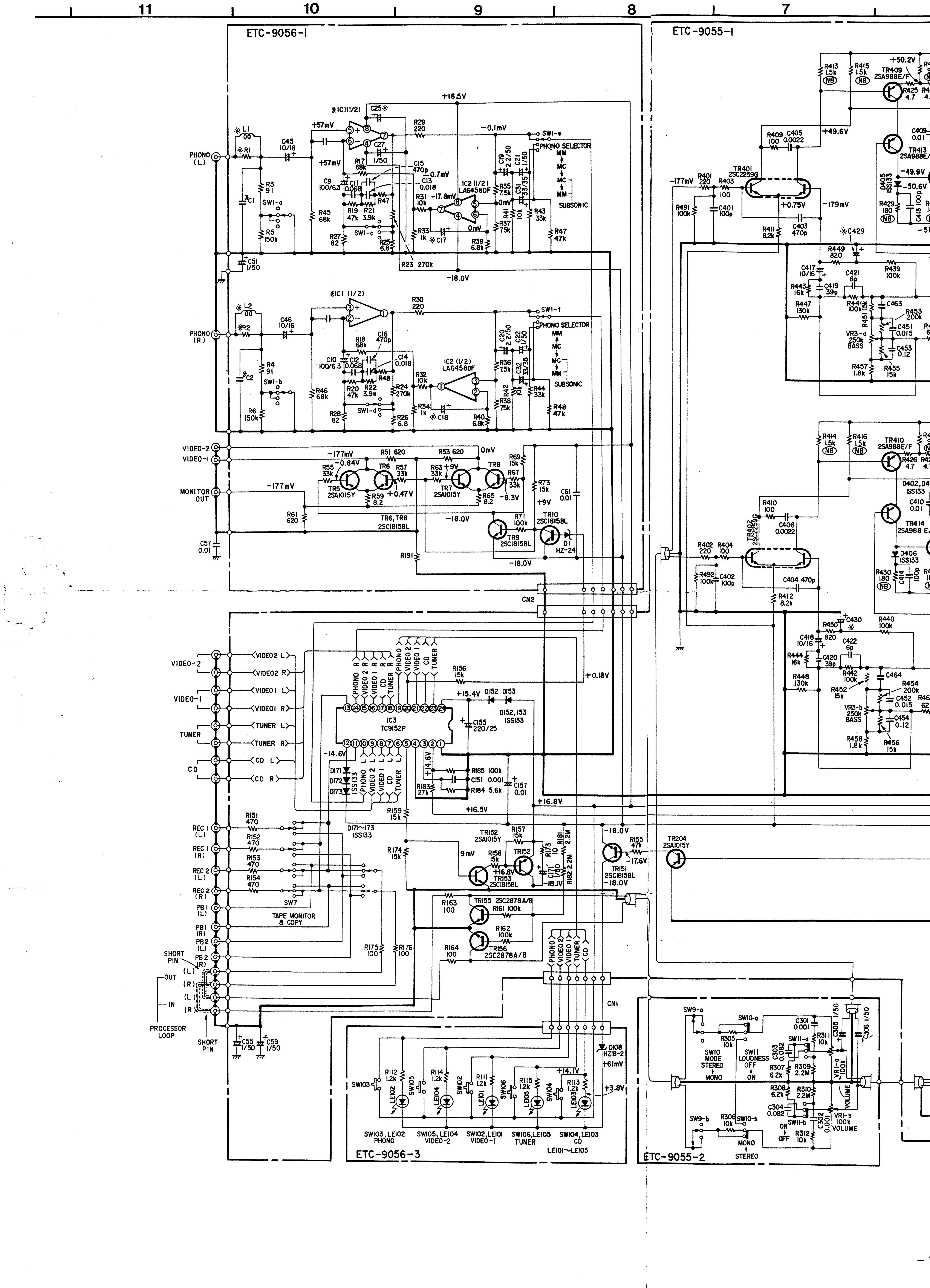
ETC9056-

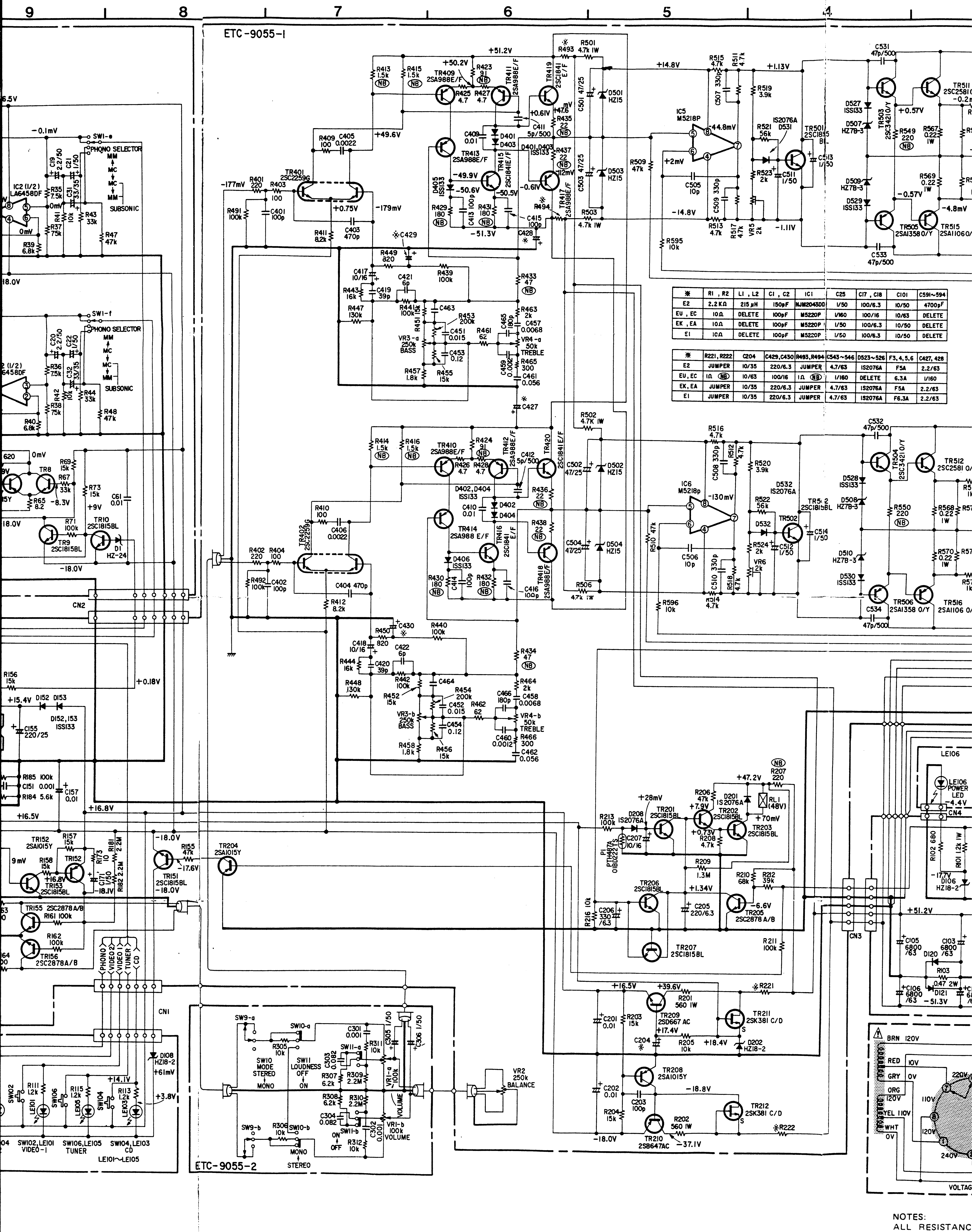
E2	B
E1	D
Eu	E
EA	F
EK	F
Ec	C

ETC9055-

E2	B
E1	D
Eu	E
EA	F
EK	F
Ec	C

SCHEMATIC DIAGRAM



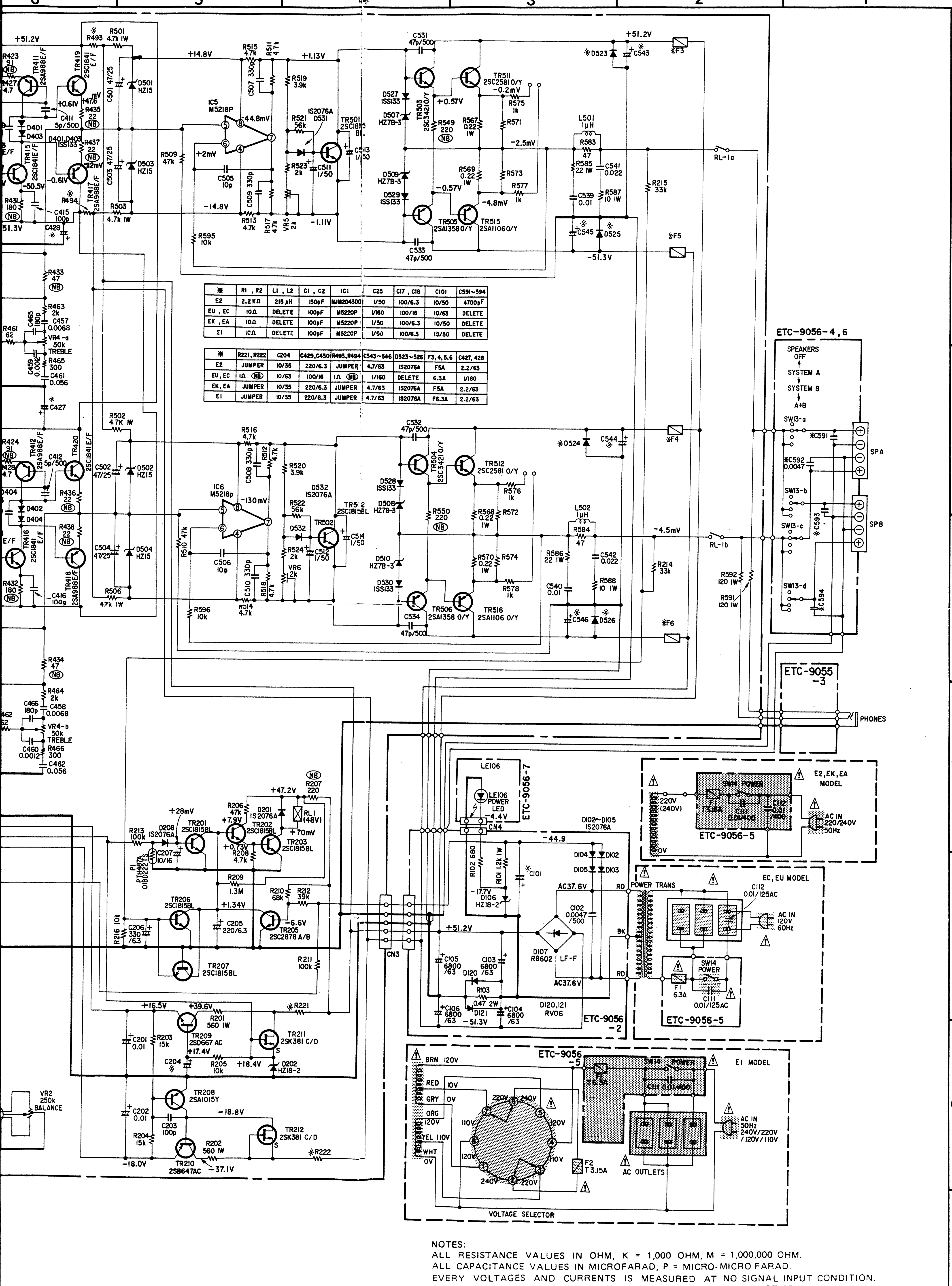


※	R1 , R2	L1 , L2	C1 , C2	IC1	C25	C17 , C18	C101	C591~594
E2	2.2 KΩ	215 μH	150pF	NJM2043DD	1/50	100/6.3	10/50	4700pF
EU , EC	10Ω	DELETE	100pF	M5220P	1/160	100/16	10/63	DELETE
EK , EA	10Ω	DELETE	100pF	M5220P	1/50	100/6.3	10/50	DELETE
E1	10Ω	DELETE	100pF	M5220P	1/50	100/6.3	10/50	DELETE

※	R221, R222	C204	C429, C430	R493, R494	C543~546	D523~526	F3, 4, 5, 6	C427, 428
E2	JUMPER	10/35	220/6.3	JUMPER	4.7/63	1S2076A	F5A	2.2/63
EU, EC	1Ω (NB)	10/63	100/16	1Ω (NB)	1/160	DELETE	6.3A	1/160
EK, EA	JUMPER	10/35	220/6.3	JUMPER	4.7/63	1S2076A	F5A	2.2/63
E1	JUMPER	10/35	220/6.3	JUMPER	4.7/63	1S2076A	F6.3A	2.2/63

NOTES:
ALL RESISTANC
ALL CAPACITAN
EVERY VOLTAG
CIRCUIT AND PA

⚠ ▒ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

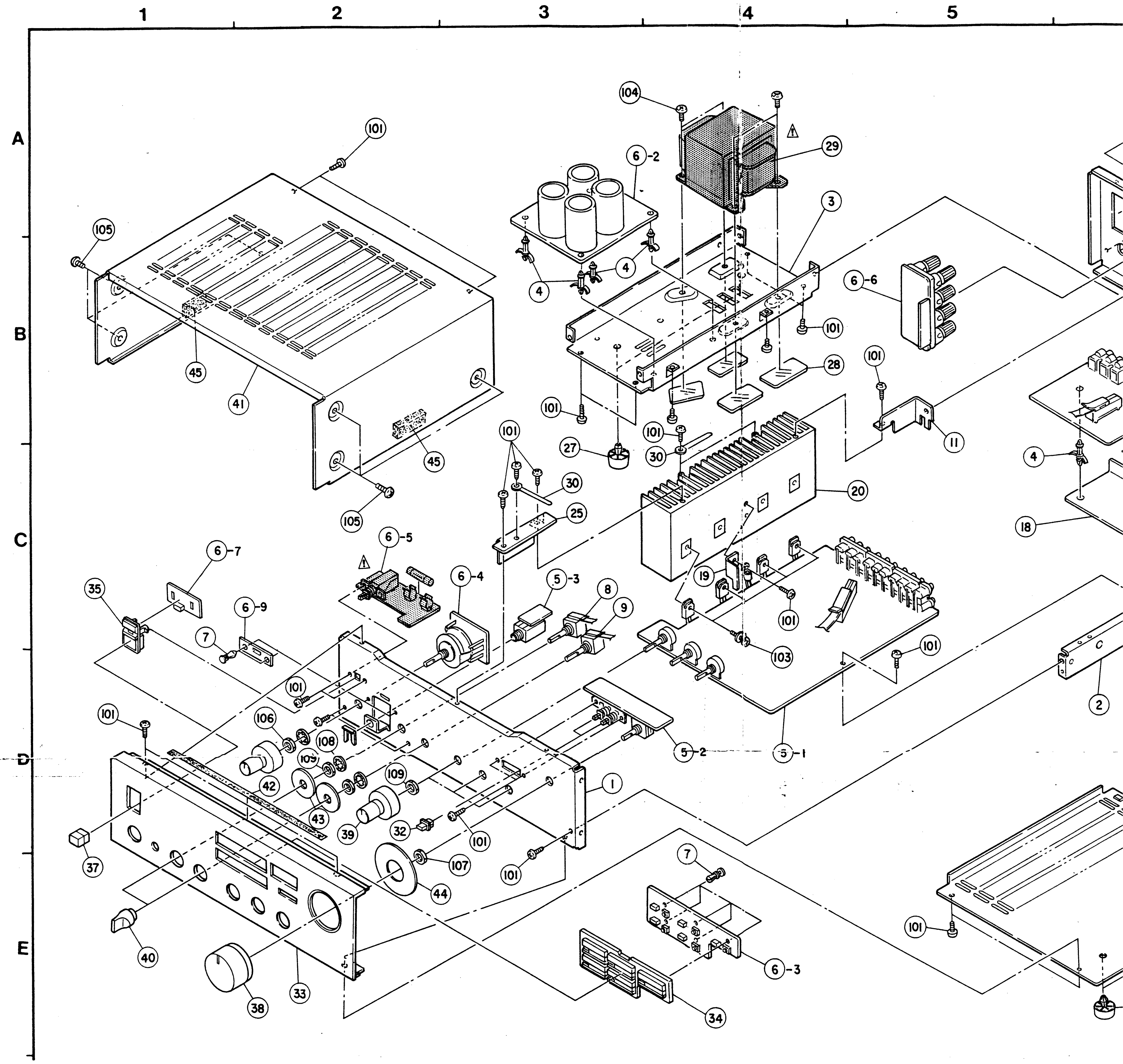


※	R1 , R2	L1 , L2	C1 , C2	IC1	C25	C17 , C18	C101	C591~594
E2	2.2KΩ	215μH	150pF	NJM2043DD	1/50	100/6.3	10/50	4700pF
EU , EC	10Ω	DELETE	100pF	M5220P	1/160	100/16	10/63	DELETE
EK , EA	10Ω	DELETE	100pF	M5220P	1/50	100/6.3	10/50	DELETE
E1	10Ω	DELETE	100pF	M5220P	1/50	100/6.3	10/50	DELETE

※	R221, R222	C204	C429, C430	R493, R494	C543~546	D523~526	F3, 4, 5, 6	C427, 428
E2	JUMPER	10/35	220/6.3	JUMPER	4.7/63	1S2076A	F5A	2.2/63
EU, EC	1Ω (NB)	10/63	100/16	1Ω (NB)	1/160	DELETE	6.3A	1/160
EK, EA	JUMPER	10/35	220/6.3	JUMPER	4.7/63	1S2076A	F5A	2.2/63
E1	JUMPER	10/35	220/6.3	JUMPER	4.7/63	1S2076A	F6.3A	2.2/63

NOTES:
ALL RESISTANCE VALUES IN OHM, K = 1,000 OHM, M = 1,000,000 OHM.
ALL CAPACITANCE VALUES IN MICROFARAD, P = MICRO-MICRO FARAD.
EVERY VOLTAGES AND CURRENTS IS MEASURED AT NO SIGNAL INPUT CONDITION.
CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

EXPLODED VIEW OF CHASSIS AND CABINET
(This figure is specifications of E2.)



Note 1. See addendum list rightside for the parts with asterisk (*) on the Ref. No. and the other parts not included in the list.
2. ★ marked not included EXPLODED VIEW OF CHASSIS AND CABINET.
3. This list is prepared based on E2 BLACK VERSION.

EXPLODED VIEW OF PARTS LIST for E2 BLACK VERSION

Ref. No.	P Part No.	Part Name & Descriptions	Q'ty
1	4119018206	FRONT CHASSIS	1
2	4119020207	SIDE CHASSIS	1
3	4119021206	TRANS CHASSIS	1
4	4150228000	P.C.B. HOLDER	6
*5	ETC9055B	INPUT & POWER UNIT	1s
*6	ETC9056B	EQ & PS UNIT	1s
7	4770210016	PUSH RIVET	7
8	2123614009	ROTARY REMOTE SW (T. MONI)	1
9	2123614012	ROTARY REMOTE SW (PHONO)	1
*10	1059053104	BACK PANEL	1
11	4129040002	BRACKET	1
12	2050071016	TERMINAL ASS'Y	1
13	4770018001	WASHER (P-87)	1
⚠*14	2062002031	AC CORD WITH PLUG	1
⚠*15	4450020005	CORD BUSH (4K-4)	1
16	—	—	—
⚠*17	2538010007	CERAMIC CAP. 0.01μF/400V (AC)	1
18	4129041001	P.W.B. SUPPORT	1
19	4129044008	BRACKET	1
20	4179013102	POWER RADIATOR	1
21	4150234007	INSULATING SHEET	4
22	2730273011	TRANSISTOR 2SC2581(O)/(Y)	2
23	2710160018	TRANSISTOR 2SA1106(O)/(Y)	2
24	2760289004	POSITIVE THERMISTOR PTH487A01BD222TS	1

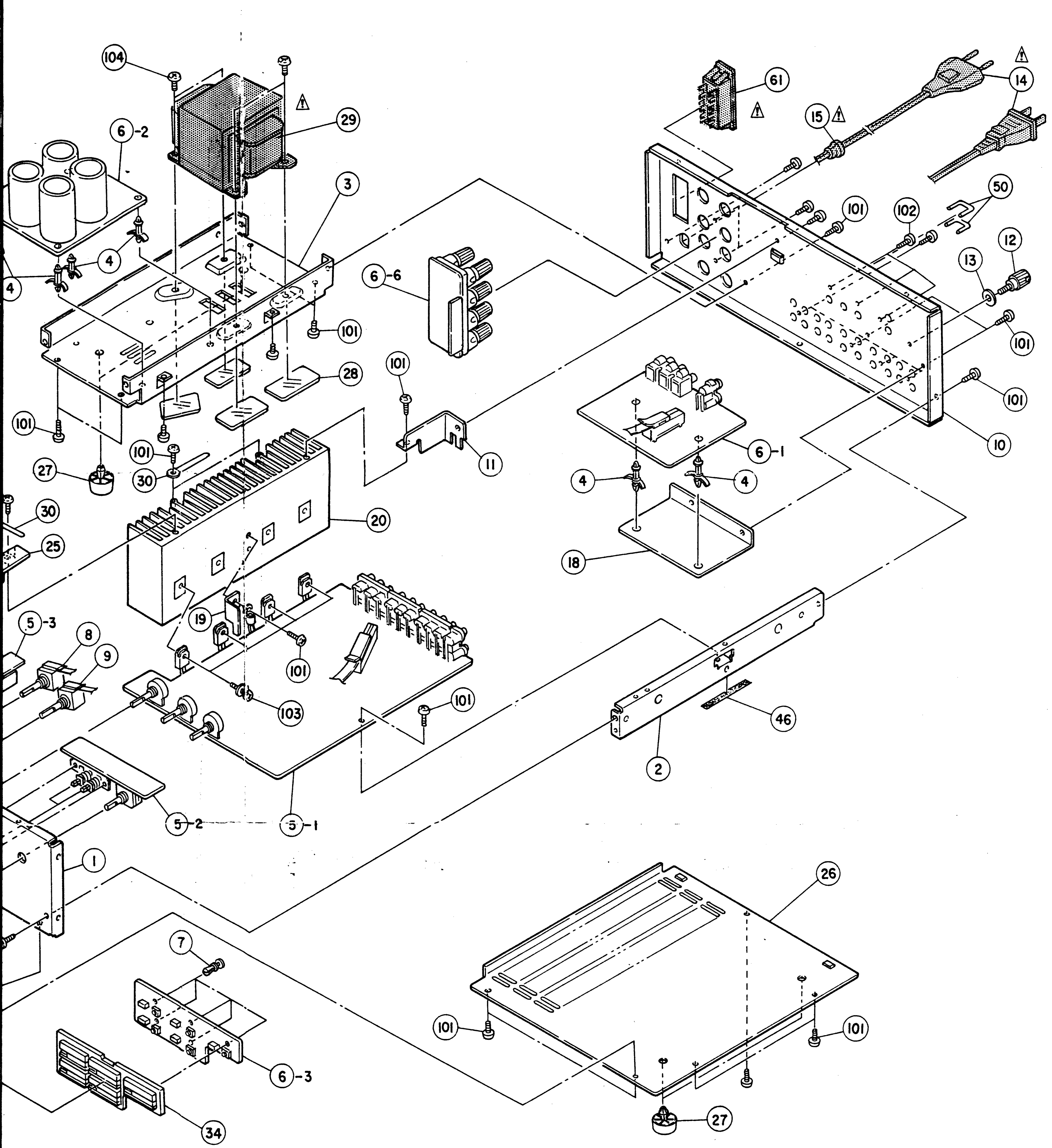
Ref. No.	Part No.	Part Name & Descriptions	Q'ty
25	4129039107	RADIATOR BRACKET	1
26	1059044207	BOTTOM COVER	1
27	1049003009	FOOT	4
28	4149017002	SAFETY PLATE	4
⚠*29	2339542004	POWER TRANS	1
30	4450048016	CORD HOLDER (L50)	3
★31	4450033005	WIRE CLAMP BAND	10
**32	1139072005	PUSH KNOB (L)	2
**33	1449025234	FRONT PANEL ASS'Y	1
**34	1139073224	PUSH KNOB (F) ASS'Y	1
**35	1469044101	KNOB GUIDE (P) ASS'Y	1
36	—	—	—
**37	1139070104	PUSH KNOB (P)	1
**38	1129012004	VR KNOB ASS'Y	1
**39	1129013207	KNOB ASS'Y	4
**40	1129014109	KNOB ASS'Y	2
**41	1029013307	TOP COVER	1
42	1229006017	SPACER	1
43	1229007029	BLIND RING	2
44	1229007032	BLIND RING	1
45	4619001001	RUBBER SHEET	2
46	—	—	—
*47	4150088004	INSULATING SHEET	1
*48	2050089008	7P W TERMINAL	1
49	1229006033	SPACER	1

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
50	2090055005	SHORT PIN	2
51	—	—	—
		SCREWS, NUTS	**Q'ty**
101	4737002034	TAPPING SCREW (S) 3x6 (BLACK)	42
102	4737500044	TAPPING SCREW (P) 3x8 (BLACK)	9
103	4700012022	CROSS PAN SCREW WITH SW, W 3x12	4
104	4737004016	TAPPING SCREW (S) 4x6	4
**105	4737007000	TAPPING SCREW (S) 4x8 (BLACK)	6
106	—	—	—
107	4756006008	NUT M3	2
		PACKING & ACCESSORIES (not included EXPLODED VIEW)	
201	5049102003	STYLEN PAPER	1
202	5059102006	POLY COVER	1
203	5039124004	CUSHION	2
**204	5019101063	CARTON CASE	1
205	5119160108	INST. MANUAL	1
**206	5139111014	COLOR LABEL (BLACK)	2
207	5138295009	CONTROL CARD	1

⚠ ▒ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

DENON

3 4 5 6 7



WARNING:

1. Component parts
Parts marked with ⚠ and/or
the specified parts for replacem

2. Leakage current
Before returning the appliance
an error of not more than 5%)
ground. Reverse the power plug
Any current measured MUST N

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e addendum list rightside for the parts with asterisk (*) on the Ref. No. and the other parts not included in the list.
marked not included EXPLODED VIEW OF CHASSIS AND CABINET.
his list is prepared based on E2 BLACK VERSION.

Part Name & Descriptions	Q'ty
DIATOR BRACKET	1
TTOM COVER	1
OT	4
FETY PLATE	4
WER TRANS	1
RD HOLDER (L50)	3
RE CLAMP BAND	10
SH KNOB (L)	2
ONT PANEL ASS'Y	1
SH KNOB (F) ASS'Y	1
OB GUIDE (P) ASS'Y	1
—	—
SH KNOB (P)	1
KNOB ASS'Y	1
OB ASS'Y	4
OB ASS'Y	2
P COVER	1
ACER	1
ND RING	2
ND RING	1
BBER SHEET	2
—	—
ULATING SHEET	1
W TERMINAL	1
ACER	1

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
50	2090055005	SHORT PIN	2
51	—	—	—
		SCREWS, NUTS	**Q'ty**
101	4737002034	TAPPING SCREW (S) 3x6 (BLACK)	42
102	4737500044	TAPPING SCREW (P) 3x8 (BLACK)	9
103	4700012022	CROSS PAN SCREW WITH SW, W 3x12	4
104	4737004016	TAPPING SCREW (S) 4x6	4
**105	4737007000	TAPPING SCREW (S) 4x8 (BLACK)	6
106	—	—	—
107	4756006008	NUT M3	2
		PACKING & ACCESSORIES (not included EXPLODED VIEW)	
201	5049102003	STYLEN PAPER	1
202	5059102006	POLY COVER	1
203	5039124004	CUSHION	2
**204	5019101063	CARTON CASE	1
205	5119160108	INST. MANUAL	1
**206	5139111014	COLOR LABEL (BLACK)	2
207	5138295009	CONTROL CARD	1

E2 GOLD VERSION PARTS LIST
(Same as BLACK VERSION except the followings.)

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
32	1139072021	PUSH KNOB (L)	2
33	1449025221	FRONT PANEL ASS'Y	1
34	1139073211	PUSH KNOB (F) ASS'Y	1
35	1469044114	KNOB GUIDE (P) ASS'Y	1
37	1139070117	PUSH KNOB (P)	1
38	1129012017	VR KNOB ASS'Y	1
39	1129013210	KNOB ASS'Y	4
40	1129014112	KNOB ASS'Y	2
41	1029013323	TOP COVER	1
105	4737014006	TAPPING SCREW (S) 4x8	6
204	5019122097	CARTON CASE	1
206	5139111001	COLOR LABEL (GOLD)	2

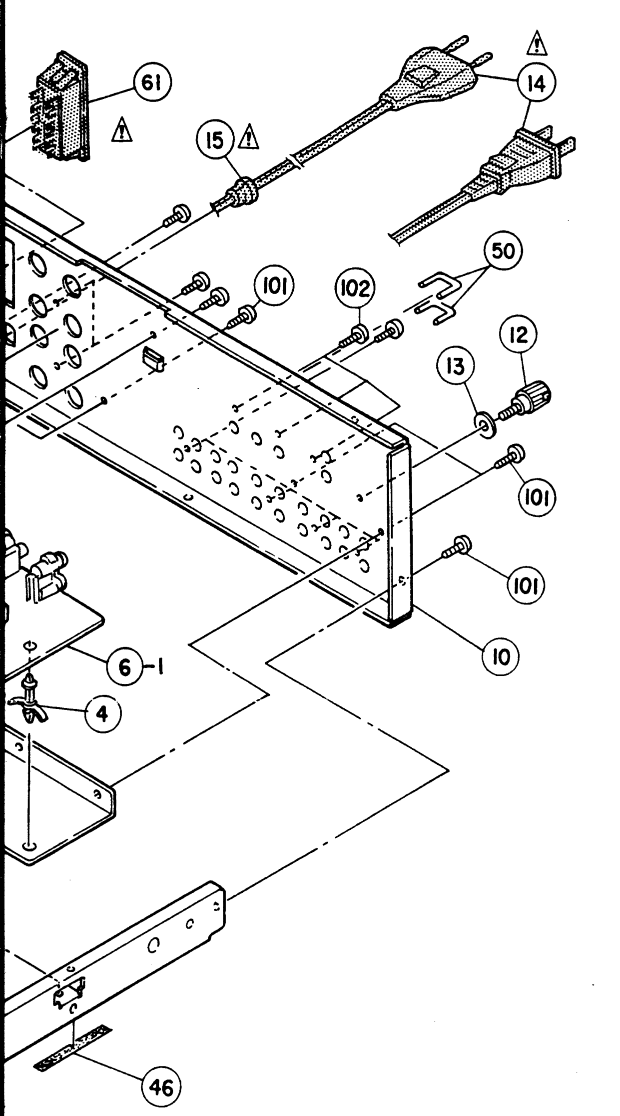
ADDENDUM LIST

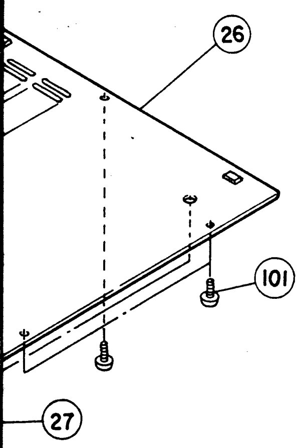
Ref. No.	Part Name & Descr
5	INPUT & POWER UNIT
6	EQ. & PS UNIT
10	BACK PANEL
⚠14	AC CORD
⚠15	CORD BUSH
⚠29	POWER TRANS
33	FRONT PANEL ASS'Y
34	PUSH KNOB (F) ASS'Y
47	INSULATING SHEET
48	7P W TERMINAL
⚠61	AC OUTLET (POLARIZED
62	DANGEROUS MARK
63	FUSE LABEL
64	LA APPROVAL MARK
⚠65	VOLTAGE SEL. SW
66	SHIELD BRACKET
67	FUSE HOLDER
⚠68	FUSE (3.15A)
69	VOLTAGE LABEL
70	CAUTION SHEET
71	BLIND SHEET
72	EARTH LABEL
73	NOTICE SHEET
74	NOTICE SHEET
107	NUT M3
111	TAPPING SCREW (S) 3x6
112	TOOTH WASHER $\phi 3$
113	3T LUG
114	TOOTH WASHER $\phi 4$
204	CARTON CASE
207	CONTROL CARD
211	SAFETY INSTRUCTION
212	WARRANTY IN ENVELO
213	IMPORTANT LABEL
214	CAUTION PAPER
215	CAUTION LABEL
216	CSA LABEL

NIPPON COLUMBIA CO.
No. 14-14, 4-CHOME AKASAKA,
MINATO-KU, TOKYO 107 JAPA

⚠ ▨ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

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E2 GOLD VERSION PARTS LIST
(Same as BLACK VERSION except the followings.)

Ref. No.	Part No.	Part Name & Descriptions	Q'ty
32	1139072021	PUSH KNOB (L)	2
33	1449025221	FRONT PANEL ASS'Y	1
34	1139073211	PUSH KNOB (F) ASS'Y	1
35	1469044114	KNOB GUIDE (P) ASS'Y	1
37	1139070117	PUSH KNOB (P)	1
38	1129012017	VR KNOB ASS'Y	1
39	1129013210	KNOB ASS'Y	4
40	1129014112	KNOB ASS'Y	2
41	1029013323	TOP COVER	1
105	4737014006	TAPPING SCREW (S) 4x8	6
204	5019122097	CARTON CASE	1
206	5139111001	COLOR LABEL (GOLD)	2

DENON

WARNING:

1. Component parts
Parts marked with ⚠ and/or shading in this service manual have special characteristics important to safety. Be sure to use the specified parts for replacement.

2. Leakage current
Before returning the appliance to customer, test the leakage current when the power plug is connected. Use a calibrated (with an error of not more than 5%) leakage current tester and measure the leakage current from any exposed metal to the earth ground. Reverse the power plug polarity and test the above again.
Any current measured MUST NOT EXCEED 0.5 miliamps. Corrective measure must be taken if it exceeds the limit.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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ADDENDUM LIST

Ref. No.	Part Name & Descriptions	Part No.				
		E1/EP1 for Asia	EU for U.S.A.	EA for Australia	EK for U.K.	EC for Canada
5	INPUT & POWER UNIT	ETC9055D	ETC9055E	ETC9055F	ETC9055F	ETC9055C
6	EQ. & PS UNIT	ETC9056D	ETC9056E	ETC9056F	ETC9056F	ETC9056C
10	BACK PANEL	1059056004	1059048009	1059053104	1059053104	1059048009
⚠ 14	AC CORD	2006031026	2062039004	2062012018	2062024006	2062039004
⚠ 15	CORD BUSH	4450028007	4450020005	MD-2982H	4450020005	4450020005
⚠ 29	POWER TRANS	2339545001	2339540006	2339547009	2339547009	2339544002
33	FRONT PANEL ASS'Y	1449025218	1449025218	1449025234	1449025234	1449025218
34	PUSH KNOB (F) ASS'Y	1139073208	1139073208	1139073224	1139073224	1139073208
47	INSULATING SHEET	–	–	4150088004	4150088004	–
48	7P W TERMINAL	–	–	2050089008	2050089008	–
⚠ 61	AC OUTLET (POLARIZED)	2033926007	2033926007	–	–	2033926007
62	DANGEROUS MARK	–	5138266009 (2)	–	–	–
63	FUSE LABEL	–	5130895038	–	–	–
64	LA APPROVAL MARK	–	5138300004	–	–	–
⚠ 65	VOLTAGE SEL. SW	2120186006	–	–	–	–
66	SHIELD BRACKET	4149021001	–	–	–	–
67	FUSE HOLDER	2020013101	–	–	–	–
⚠ 68	FUSE (3.15A)	2061015074	–	–	–	–
69	VOLTAGE LABEL	–	–	5130362008 (2)	5130362008 (2)	–
70	CAUTION SHEET	–	–	–	5130364006	–
71	BLIND SHEET	–	–	5130348006	–	–
72	EARTH LABEL	–	–	5130140000	–	–
73	NOTICE SHEET	–	–	5130209006	–	–
74	NOTICE SHEET	–	–	5130210008	–	–
107	NUT M3	–	–	4756006008 (2)	4756006008 (2)	–
111	TAPPING SCREW (S) 3x6 BLACK	4737002034 (3)	–	4737002034 (1)	–	–
112	TOOTH WASHER $\phi 3$	–	–	4753001051 (5)	–	–
113	3T LUG	–	–	2050003107	–	–
114	TOOTH WASHER $\phi 4$	–	–	4753100004 (6)	–	–
204	CARTON CASE	5019101063	5019104060	5019101063	5019101063	5019104060
207	CONTROL CARD	–	–	–	–	–
211	SAFETY INSTRUCTION	–	5111041005	–	–	–
212	WARRANTY IN ENVELOPE	5158053108/ 5158052206	5150349108	–	–	–
213	IMPORTANT LABEL	–	–	–	5139133005	–
214	CAUTION PAPER	–	–	5130211007	–	–
215	CAUTION LABEL	–	–	–	–	–
216	CSA LABEL	–	–	–	–	5138311006

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